

~~LG-12-91-00~~

FEASIBILITY STUDY

Charlotte
NC 49/Graham Street Connector
Mecklenburg County

R-2420

FILE COPY
DO NOT REMOVE
FROM FILE

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation


Project Planning Engineer


Unit Head

7-15-88
Date


Manager, Planning and Research

Charlotte
NC 49/Graham Street Connector
Mecklenburg County

This study has been developed as a result of a request by the City of Charlotte. The project is not included in the Transportation Improvement Program and is not currently funded.

This report is provided for informational purposes only. Because of the complexity of the project, a more detailed study will be required before an alternative can be selected.

I. GENERAL DESCRIPTION

The studied project consists of constructing a four lane, median divided highway on new location between NC 49 and Graham Street in Mecklenburg County (See Figure 1). Partial control of access with designated access points is under consideration. Interchanges with Interstate 85 and US 29/NC 49 are being studied. The project is approximately 2.8 miles long.

It has been requested that a study of the feasibility of adding a new ramp to the Harris Boulevard/NC 49 interchange be included in this report. See Section VI for a discussion of this ramp.

II. PURPOSE OF PROJECT

The project will serve several functions. First, it will partially relieve traffic congestion on Harris Boulevard which is located north of and parallel to the studied connector. Traffic demand on Harris Boulevard is expected to greatly exceed the traffic carrying capacity of the facility. The Finding of No Significant Impact for the Harris Boulevard widening (Project U-2004) states that the proposed I-85 interchange will only accommodate 80% of the design year traffic at level of service C in the design year. A connector between NC 49 and Graham Street, with an additional interchange at I-85, would provide an alternative access to the University Research Park area and would thereby reduce the demand on the I-85/Harris Boulevard interchange.

Secondly, the studied facility will allow direct access from I-85 to property in the area. It will provide improved traffic circulation for the IBM complex by giving access to I-85 south of Harris Boulevard. Because IBM is a major traffic generator located at the Harris Boulevard interchange, provision of another interchange south of Harris Boulevard will divide the traffic generated by the IBM facility between two interchanges.

The projected traffic volume using the studied project in the 2008 design year is 51,200 vehicles per day.

III. ALTERNATIVES CONSIDERED

The cross section studied for the connector is a four lane roadway with shoulders divided by a 46 foot median. Partial control of access with access restricted to specific access points has been evaluated. Between Graham Street and US 29, one alignment was evaluated for purposes of this study. The interchange of the connector and I-85 is located within this section. One interchange configuration, a partial cloverleaf with ramps in all four quadrants and loops in the northwest and southeast quadrants, was studied. A further evaluation of this configuration will be done during the development of the project study when more detailed traffic projections are available.

Three alternative treatments for the intersection of the connector with US 29/NC 49 were considered. Alternative 1 consists of an interchange at US 29 and a flyover at NC 49. See Figure 2. With this alternative the existing flyover system at the juncture of US 29/NC 49 will be maintained and widened. There are approximately 14 residential and 8 business relocatees involved with Alternative 1.

Alternative 2 consists of an interchange/flyover concept similar to Alternative 1 at the intersection of the connector and US 29/NC49. See Figure 3. With this alternative, the existing flyover system joining US 29 and NC 49 will be modified and an interchange will be added at the southernmost flyover. US 29 will become a multi-lane roadway (not median divided) between the new connector and the southernmost interchange. Access will be fully controlled in the vicinity of the interchange complex and a frontage road will be required to provide access east of NC 49. There are approximately 12 residential and 11 business relocatees involved with Alternative 2.

Alternative 3 consists of at-grade intersections at US 29 and NC 49. See Figure 4. The existing flyover system joining US 29 and NC 49 will be retained. There are approximately 7 residential and 6 business relocatees involved with Alternative 3.

The following is the cost of the alternative concepts which were considered for this report. The costs for each alternative represent the entire project from Graham Street to NC 49 including roadway and interchange costs.

ALTERNATE 1

Construction	\$16,500,000
Right-of-Way	\$21,650,000
TOTAL COST	\$38,150,000

ALTERNATE 2

Construction	\$18,400,000
Right-of-Way	\$26,850,000
TOTAL COST	\$45,250,000

ALTERNATE 3

Construction	\$15,100,000
Right-of-Way	\$10,850,000
TOTAL COST	\$25,950,000

IV. ENVIRONMENTAL CONCERNS

A reconnaissance of the project area did not reveal any areas of probable significant environmental concern.

V. CONCLUSIONS

Implementation of the project will improve traffic circulation in the University Research Park area northeast of Charlotte. Additional study will be necessary to determine the feasibility of the project. The next stage of project development is the application to the FHWA for additional access onto Interstate 85 in order to determine whether another interchange will be allowed. Without the interchange with I-85, the new connector will not be feasible. The study required for this application is already underway in the Planning and Research Branch.

The alternatives presented in this report were developed without the benefit of detailed traffic, environmental and land use data. Before a valid decision can be made, a detailed project study should be done. It is anticipated that an Environmental Impact Statement will be required for this project if it is developed as a federal-aid project. The alternatives developed for this report should be evaluated in the Draft EIS to determine which is the most feasible.

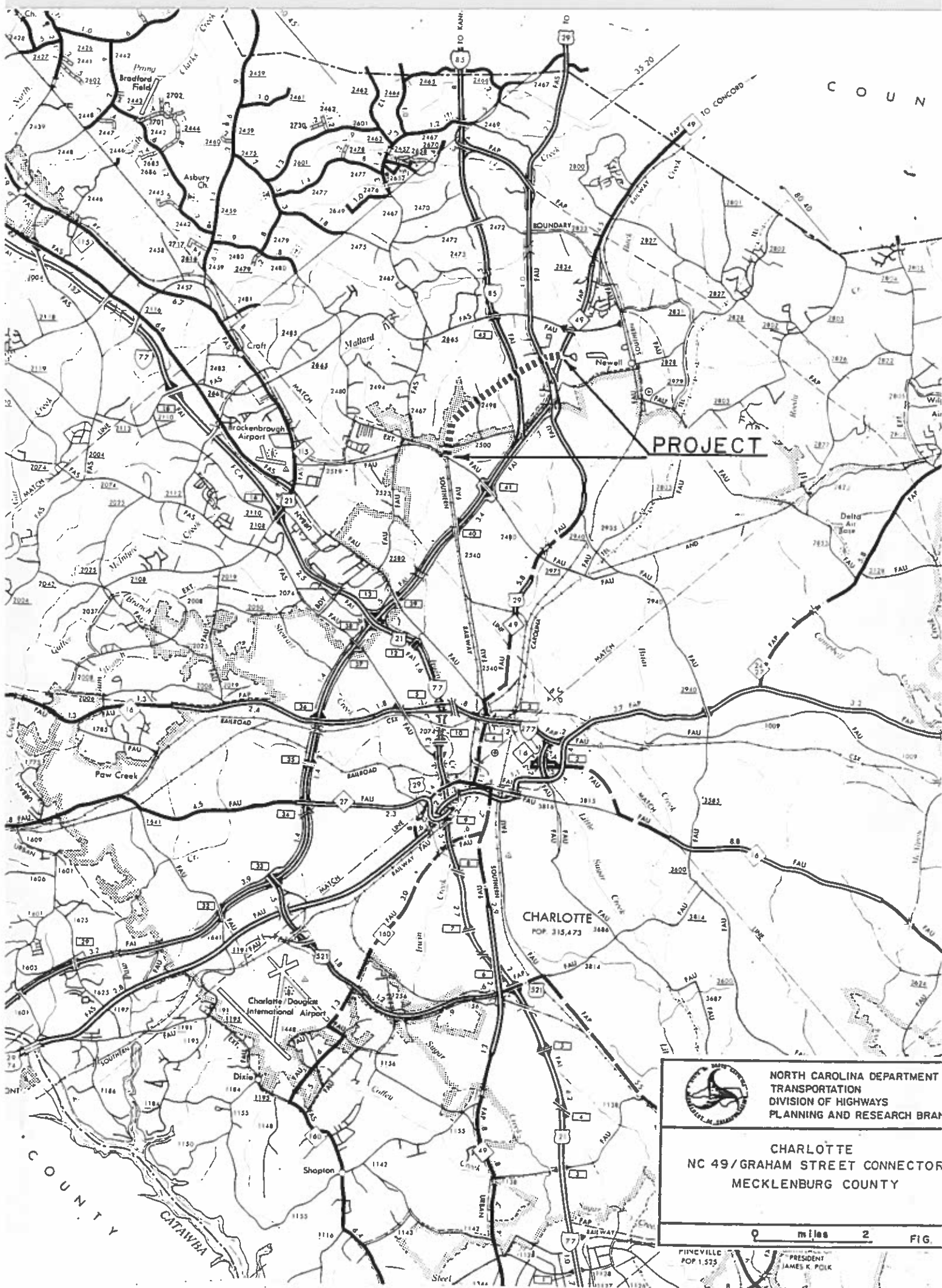
VI. HARRIS BOULEVARD/NC 49 INTERCHANGE RAMP

The existing Harris Boulevard/NC 49 interchange is a half clover type with ramps and loops in the northeast and northwest quadrants. It allows movements in all directions.

The Roadway Design Unit has investigated the feasibility of adding a ramp in the southwest quadrant. This ramp would create a more direct move for traffic which now must turn left across NC 49 onto the loop in the northwest quadrant.

The Roadway Design Unit reports that the addition of the ramp would not raise the level of service in the design year and would cost approximately \$2,225,000 (see attached memoranda dated May 4, 1988 and April 26, 1988). Based upon the findings contained in the Roadway Design report, construction of this ramp does not appear feasible.

WHW/wp



C O U N

PROJECT

CHARLOTTE
POP. 315,473



**NORTH CAROLINA DEPARTMENT
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRAN**

**CHARLOTTE
NC 49/GRAHAM STREET CONNECTOR
MECKLENBURG COUNTY**

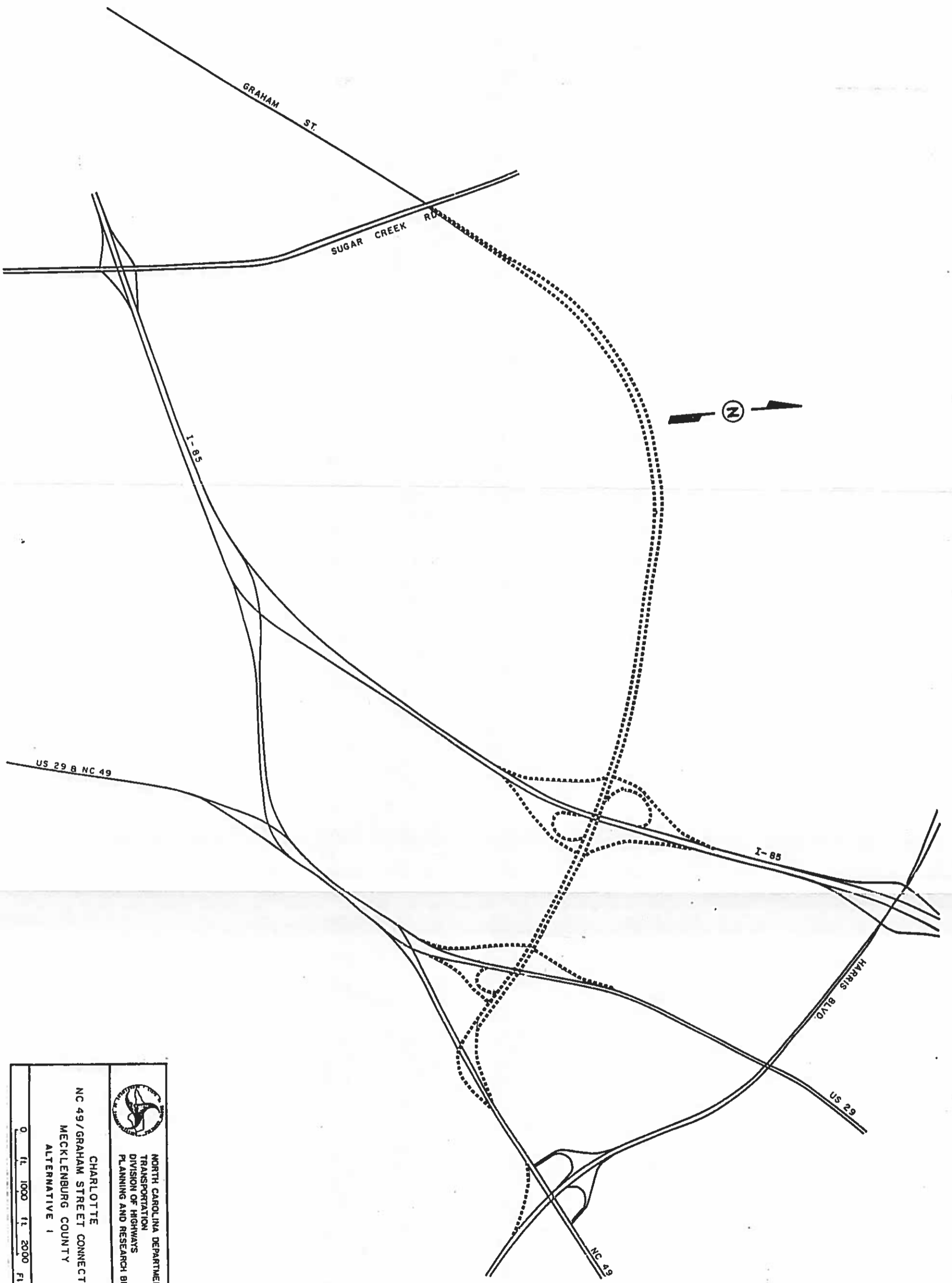
0 miles 2 FIG.


PINEVILLE
POP. 1,523

PRESIDENT
JAMES K. POLK

C O U N T Y

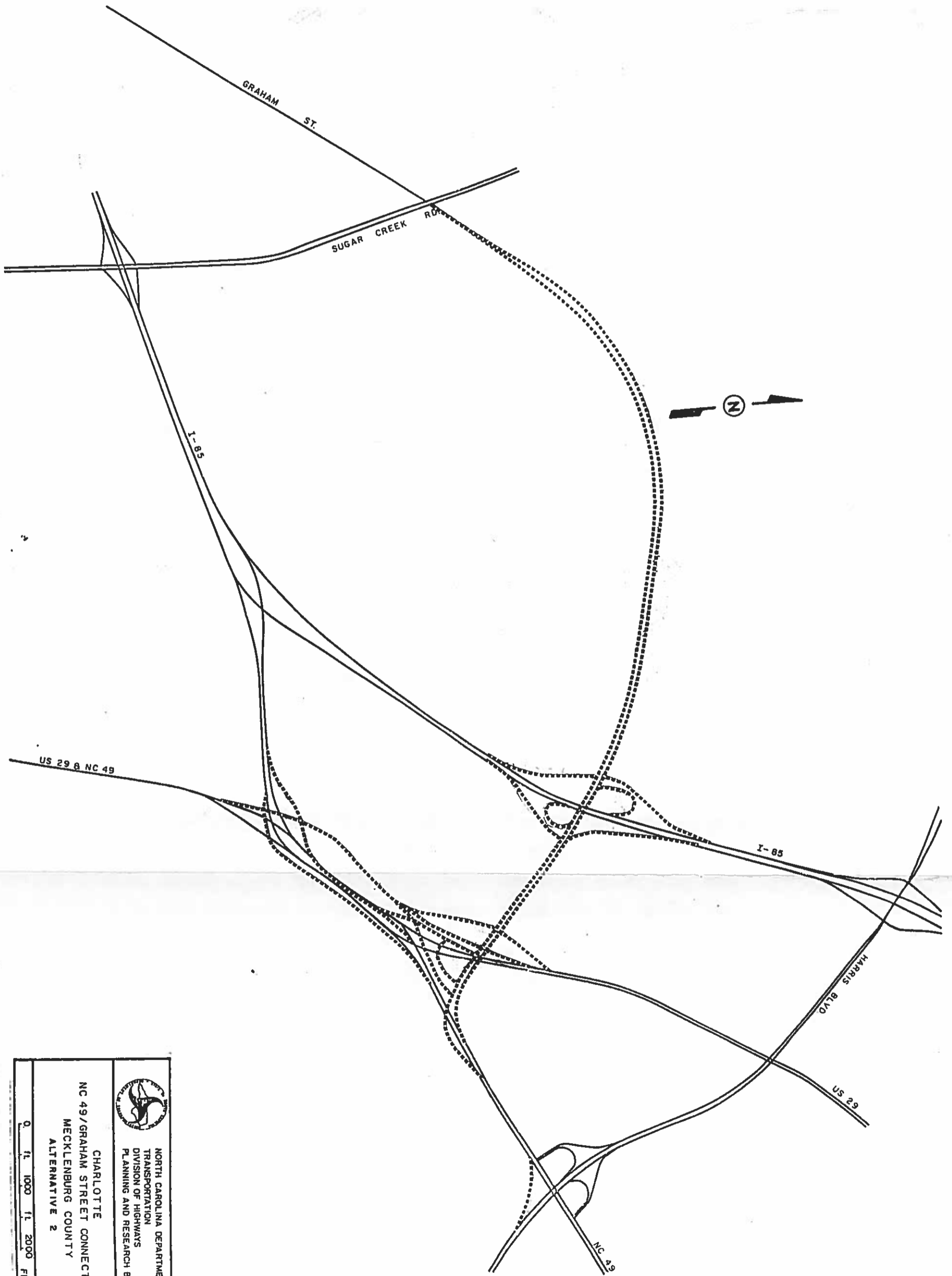
CATAWBA




 NORTH CAROLINA DEPARTMENT OF
 TRANSPORTATION
 DIVISION OF HIGHWAYS
 PLANNING AND RESEARCH BRANCH

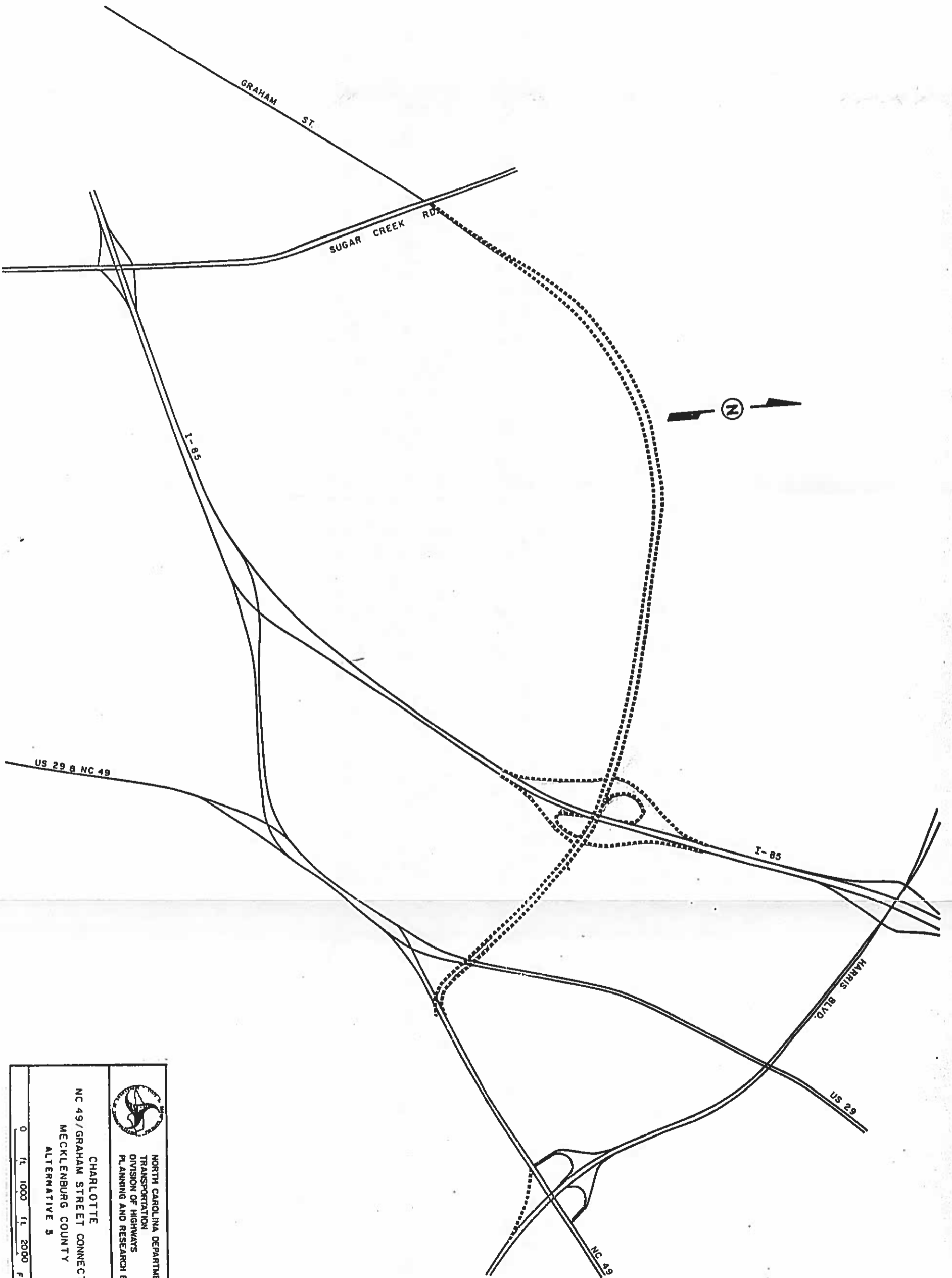
CHARLOTTE
 NC 49/GRAHAM STREET CONNECTOR
 MECKLENBURG COUNTY
 ALTERNATIVE 1


0 1/4 1/2 1000 1/2 2000 FIG. 2



NORTH CAROLINA DEPARTMENT OF
 TRANSPORTATION
 DIVISION OF HIGHWAYS
 PLANNING AND RESEARCH BRANCH
 CHARLOTTE
 NC 49/GRAHAM STREET CONNECTOR
 MECKLENBURG COUNTY
 ALTERNATIVE 2

0 1/4 1/2 1000 1/2 2000 FIG. 3



	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANNING AND RESEARCH BRANCH
	CHARLOTTE NC 49/GRAHAM STREET CONNECTOR MECKLENBURG COUNTY ALTERNATIVE 3
0 1000 1000 2000 FT. FIG. 4	



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

W.A. Wilson
APR 5-5-88
JPM

ROADWAY DESIGN UNIT
RECEIVED
[Signature]
MAY 4 1988
Refer To: *Seasons*
File _____
Handle _____
Prepare Reply _____

DIVISION OF HIGHWAYS

GEORGE E. WELLS, P.E.
STATE HIGHWAY ADMINISTRATOR

JAMES G. MARTIN
GOVERNOR

May 4, 1988

JAMES E. HARRINGTON
SECRETARY

MEMO TO: Dr. L. R. Goode, P. E.
Manager, Program and Policy Branch

FROM: J. T. Peacock, Jr., P. E. *J. T. Peacock, Jr.*
State Highway Engineer - Design

SUBJECT: Harris Boulevard/NC 49 Interchange, Mecklenburg County
Cost Estimate

As you requested, we have prepared preliminary designs and cost estimates for adding a ramp in the southwest quadrant of the Harris Boulevard/NC 49 interchange. The ramp will eliminate the left turn presently required for NC 49 northbound traffic desiring to go east on Harris Boulevard. Attached is an April 26, 1988 letter from Mr. W. A. Wilson, in which summarizes the costs of the two ramp designs investigated.

Alternatives #2, which provides a more traditional ramp design connection to NC 49 and would allow right turn on red movements to take place at signalized intersection, is estimated to cost ~~\$2,152,000~~ (\$1,550,000 for right of way and \$675,000 for construction). *A 2,225,000*

It is our recommendation that a feasibility study by Planning & Research be prepared to determine the need and justification of this ramp. This study should be included with or coordinated with the feasibility study presently being prepared for the NC 49-Graham Street Connector.

Please let us know if you would like additional information.

JTP/blj

cc: Mr. W. G. Marley, Jr., P. E.
Mr. W. A. Wilson, Jr.
Mr. J. M. Greenhill, P. E.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

April 26, 1988

JAMES G. MARTIN
GOVERNOR

JAMES E. HARRINGTON
SECRETARY

J. T. Peacock
HIGHWAY DESIGN BRANCH
RECEIVED FILE _____
MAY 02 1988
RDV _____ Take Appropriate Action
STR _____ Present Answer
DES _____ Prepare Reply For
GEO _____ My Signature
LCC _____ Prepare Reply For
PHD _____ Sect's Signature
HYD _____ For Your Information
C/W _____ DIVISION OF HIGHWAYS
WAS _____ Return With More Details
EDW _____ Suspend
Other _____
GEORGE E. WELLS, P.E.
STATE HIGHWAY ADMINISTRATOR

MEMORANDUM TO: J. T. Peacock, Jr., P.E.
FROM: *For* W. A. Wilson, Jr. *Howard Carter*
SUBJECT: Functional design adding Ramp 'B' to the existing half clover at Harris Blvd. and NC 49 in Mecklenburg County

We have completed the functional design requested in your letter dated March 30, 1988. We considered two alternatives. Alternative number one was a tight slip ramp, that reduced the amount of Right of Way taken to a minimum. Alternate number two is a more traditional ramp design tying in at the existing ramp terminal at approximately ninety degrees.

The cost for each alternative is as follows:

	Alternate #1	Alternate #2
Right of Way	1,462,000	1,550,000
Utility	40,000	-0-
Construction	650,000	675,000
TOTAL	2,152,000	2,152,000 2,225,000

To determine the advantages and disadvantages of adding Ramp 'B', new traffic data was obtained. The traffic data reflects future projects in the area, but does not reflect the Charlotte outer loop being constructed by the year 2008. Also, the traffic volumes supplied have no volumes at the private access points on the South side of NC 49 at the signal locations. These movements will have a profound effect on the operation of the signals at the ramp terminals but are not reflected in the traffic analysis.

The traffic analysis showed the existing intersection will operate at a LOS(Level of Service) F using the projected year 2008 traffic. The adding of Ramp 'B' to the interchange will help the capacity, but the intersection will still operate at a LOS F during the peak hour volumes.

The intersection was then analyzed with NC 49 being widen to a basic six lane facility, with appropriate turning lanes. The widening of NC 49 produced a LOS B, without adding ramp 'B'. A LOS A was obtained with Ramp 'B'. Both intersection will operate with moderate delays to the traveling public.

Evaluating the overall traffic volumes the turning volumes are low when compared to the through volumes. Therefore, the most efficient way to improve the capacity of the intersection on NC 49 is to add through lanes. This will also improve the capacity at the Ramp 'D' terminal.

We would like to discuss the design consideration with you at your convenience, please contact Mr. J. B. Sessoms Project Engineer.

WAWjr/jpm

Attachments

cc: Dr. Larry R. Goode P.E.
Project File(Sessoms)